NWS Form E-5 U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE **MONTHLY REPORT OF HYDROLOGIC CONDITIONS**	**HYDROLOGIC SERVICE AREA:** Pocatello, Idaho (PIH) **REPORT FOR:** **MONTH:** October **YEAR:** 2016
TO: Hydrologic Operations Division, W/OH2 National Weather Service National Oceanic and Atmospheric Administration Silver Spring, Maryland 20910	**SIGNATURE** Corey Loveland / Travis Wyatt Service Hydrologist / Acting **DATE:** November 8, 2016
When no flooding occurs, include miscellaneous river conditions, such as significant rises, record low stages, ice conditions, snow cover, droughts and hydrologic products issued (NWS Instruction 10-924).	

☐ **An X in this box indicates that *no* flooding has occurred for the month within this hydrologic service area.**

Overview:

October was a banner month for precipitation. We broke daily maximum records in Burley and Stanley on the 28th. Monthly total rainfall was 5.85 inches in Swan Valley and 4.99 inches in Driggs. Some localized flooding occurred on Badger Creek in Teton county where Highway 32 was overtopped and temporarily closed from excessive rainfall on October 29th. No major impacts besides water flowing over the roadway was reported. A beneficial amount of rain fell across the Hydrologic Service Area (HSA) to moisten the dry soils with mostly two inches in the Snake Plain, five to six inches in the mountainous areas and over 10 inches in the Teton Range and a small part of the central mountains. Across the HSA, mostly 200 to 600 percent of normal widespread precipitation fell. Temperature departures from normal for October show that across the HSA, we ranged near to slightly above normal, mostly negative one to positive three degrees F near normal. Mean average temperatures ranged from 36 to 53 degrees F across the HSA.

As far as the short-term 8 to 14 day Climate Prediction Center Outlook is concerned, the forecast of mostly 33 to 40 percent above normal temperatures across eastern Idaho and divided between near normal (eastern half of HSA and about 33 percent below normal for the eastern section of the HSA. The one-month forecast graphics are found below. For the three-month outlook, the temperature is forecast to be warmer than normal across the southwest; with a 40 to 50 percent chance of above normal temperatures over eastern Idaho. As for three-month outlook for precipitation, the outlook is good news for a 40 percent chance of above normal precipitation pattern across most of eastern Idaho.

Of the data available for the month, the station within the HSA reaching the highest 24-hour temperature was the Minidoka Dam COOP station reaching 83°F on the 1st. The station (non-SNOTEL and non-RAWS) with the lowest recorded temperature was the Rexburg BYU-Idaho COOP station at 10°F on October 12th. The highest recorded 24-hr precipitation (non-SNOTEL) occurred at the Bern COOP station where 1.85 inches fell on the 17th. The highest recorded precipitation total (non-SNOTEL) occurred at the Swan Valley COOP station where 5.85 total inches was recorded for the month. The White Elephant SNOTEL recorded 12.10 inches of total precipitation for the month! The basins receiving the greatest precipitation were the Henrys Fork-Falls River and Big Lost basins receiving 322% and 313% of average precipitation respectively for the month of October-based on SNOTEL data.

Reservoirs last month increased capacity overall by around 9% in the upper Snake River basin system (an increase of about 375 KAF occurred over the month and is currently sitting at 33% of capacity overall). Compared to last year at this time, it was about 33% of capacity as well. According to the Natural Resources Conservation Service and U.S. Bureau of Reclamation reservoir data, the most notable increase in storage capacity were the Island Park reservoir and Little Wood reservoir increasing percent capacity by 16% and 14% respectively. Both Ririe and Milner decreased capacity by 11% and 8% respectively for the month. Little Wood reservoir is currently has the highest percent of average at 153 and Palisades reservoir is at the lowest: 41% of average.

Current streamflow conditions in eastern Idaho are mostly near normal for monthly streamflows for the majority of the unregulated streams (see USGS streamflow graphic below).

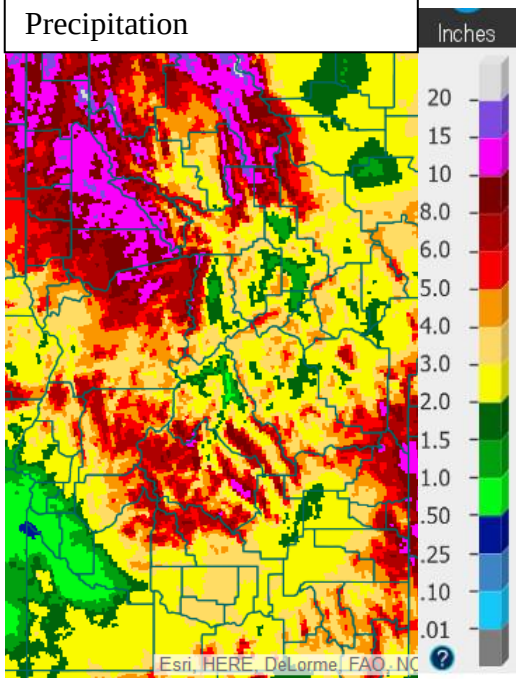
Drought conditions across eastern Idaho have improved in October as reflected on the latest U.S. Drought Monitor update where Moderate Drought conditions have improved to Abnormally Dry in the Henrys Fork basin and also have improved throughout the HSA. Currently, about 17 percent of the state is in Abnormally Dry drought status with about 1% of the state in Moderate Drought. The latest update of the U.S. Seasonal Drought Outlook has improved eastern Idaho's drought outlook forecast.

The Idaho Water Year 2016 CoCoRaHS precipitation totals are in. Of the 21 reporting stations in eastern Idaho, the top five that received the most precipitation were:

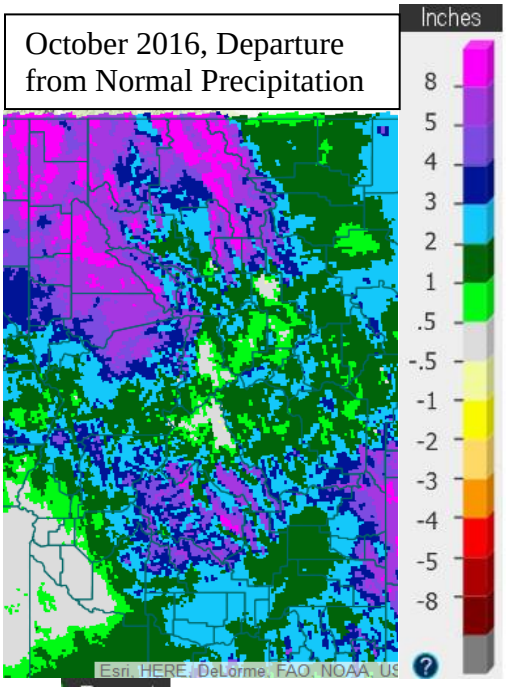
Station Name	Total Prcp Sum	Days With Prcp	Total Snowfall	Days With Snowfall	Days With Snow On Ground	Elevation
Soda Springs 0.3 W	19.36	115	90.4	50	119	5806
Grace 5.6 SSE	19.21	98	79.1	31	14	5496
Holbrook 4.0 NNE	19.09	77	58.3	27	47	4897
Bellevue 0.3 SSE	18.51	69	83.3	23	6	5191
Pocatello 1.9 E	17.67	90	39.85	29	77	4921

Precipitation:

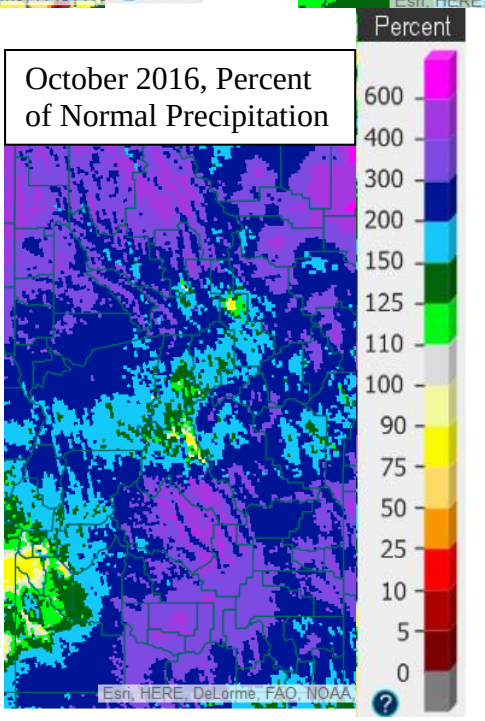
October 2016, Observed Precipitation



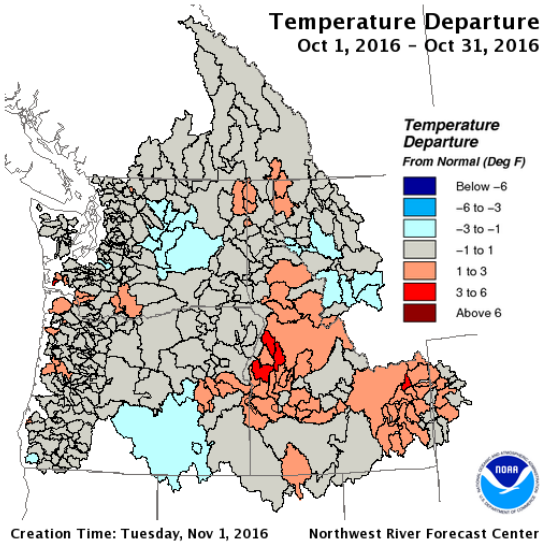
October 2016, Departure from Normal Precipitation



October 2016, Percent of Normal Precipitation



water.weather.gov/precip/#



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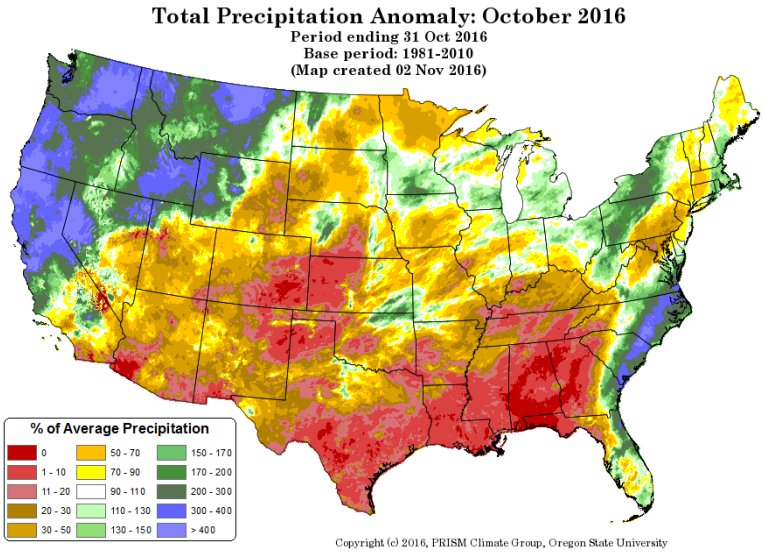
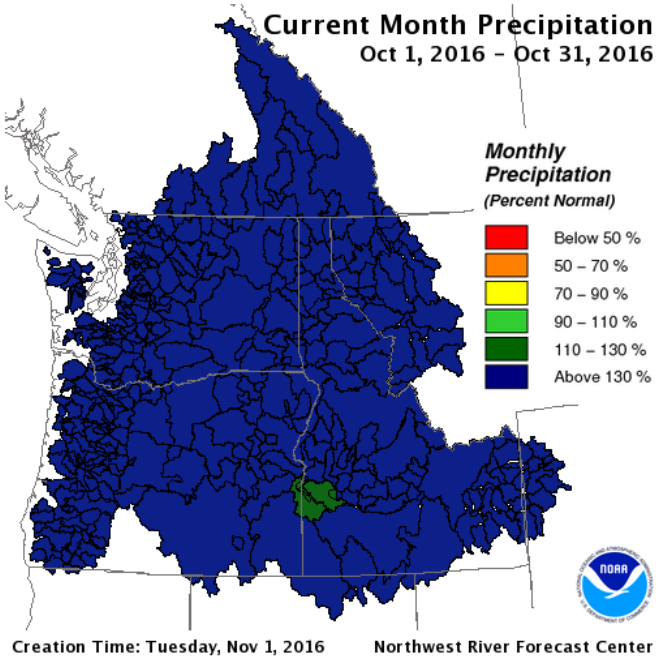


prism.oregonstate.edu/



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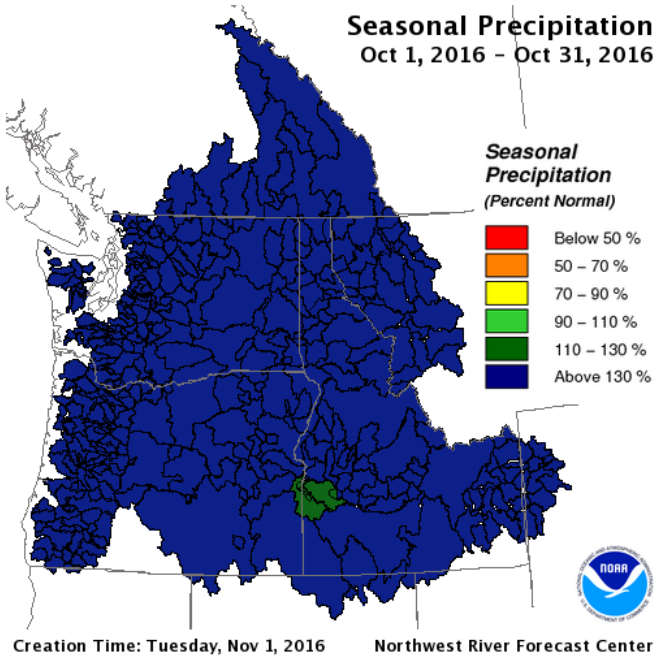

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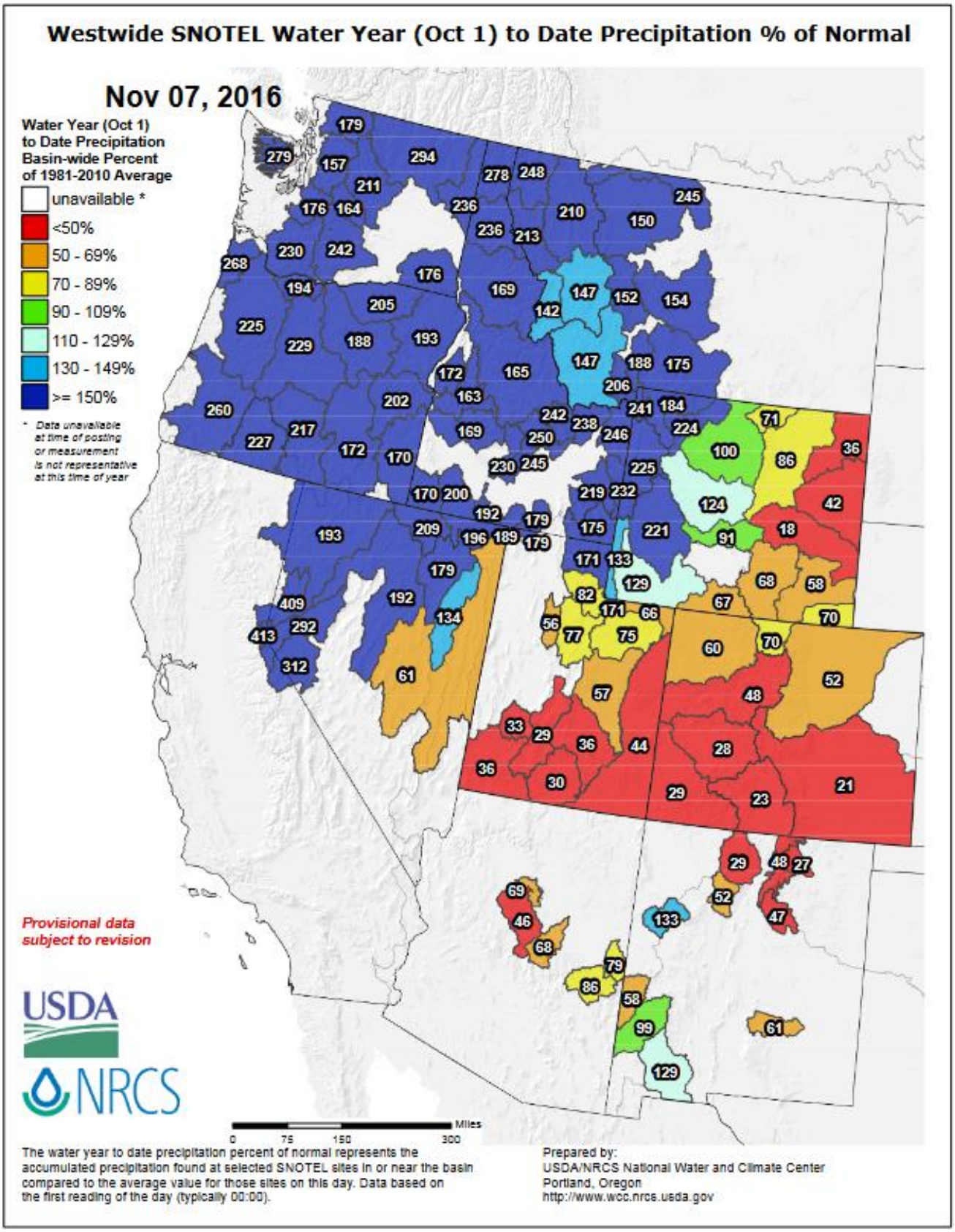
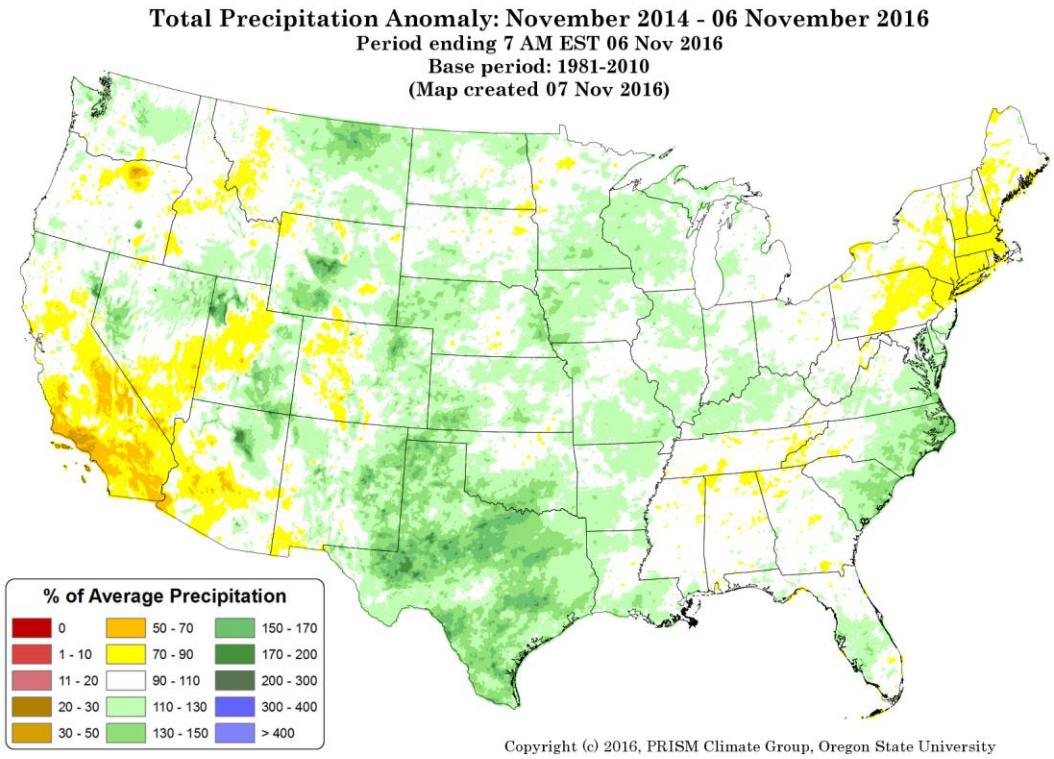
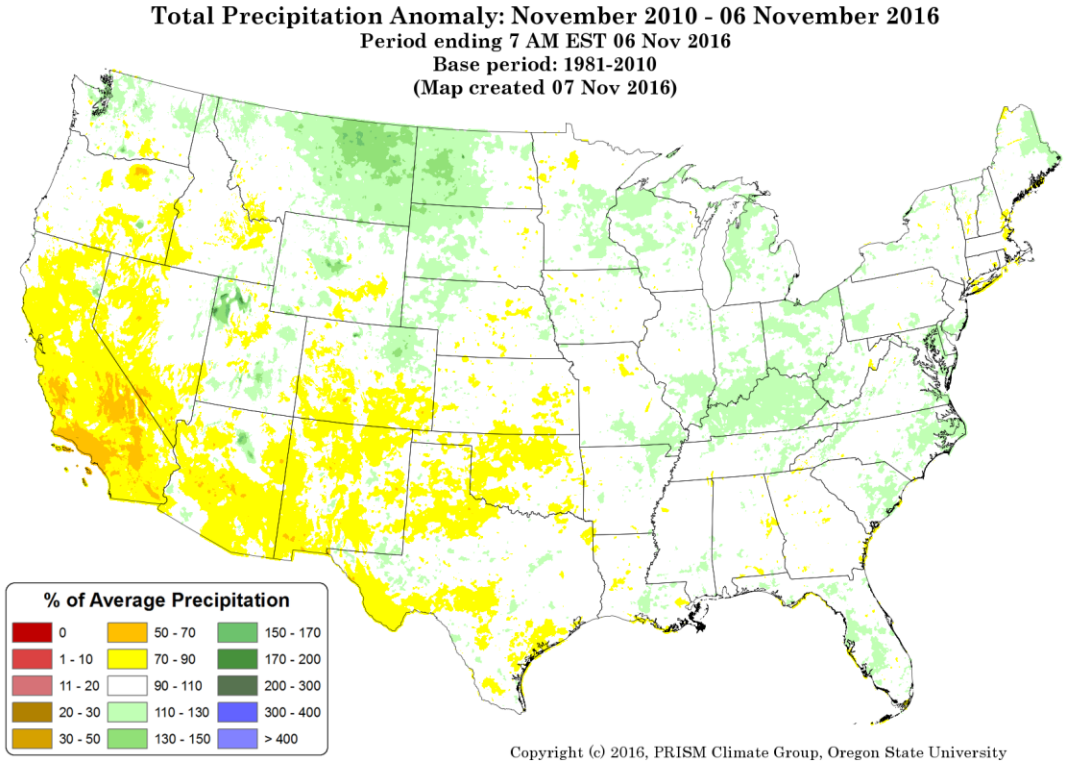


wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_wytdprecpctnormal_update.pdf

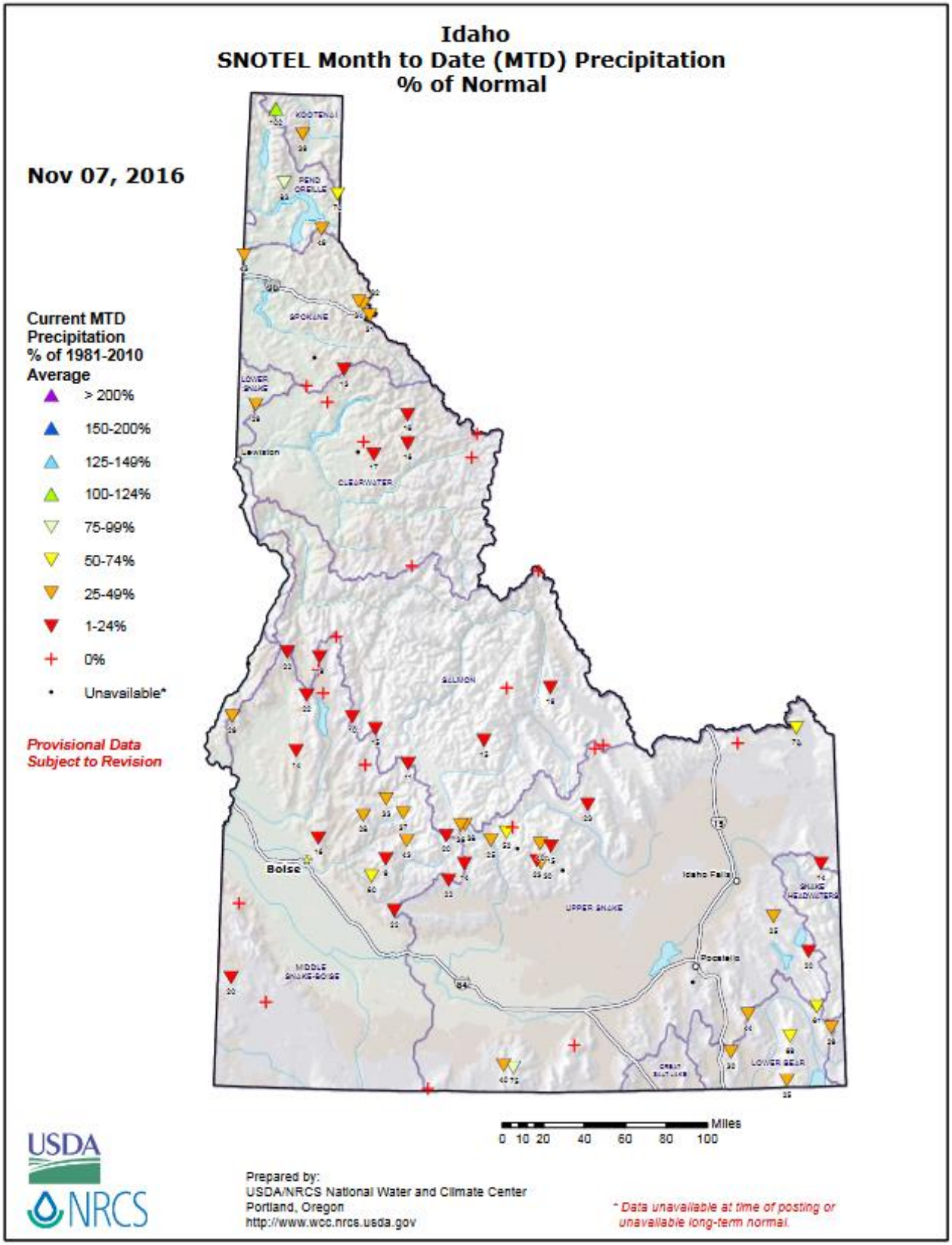
Past 2 Years of Precipitation % of Average:



Past 6 Years of Precipitation % of Average:



prism.oregonstate.edu/comparisons/drought.php



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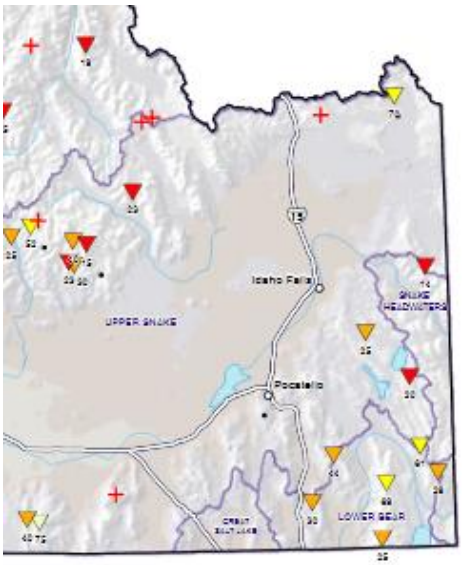
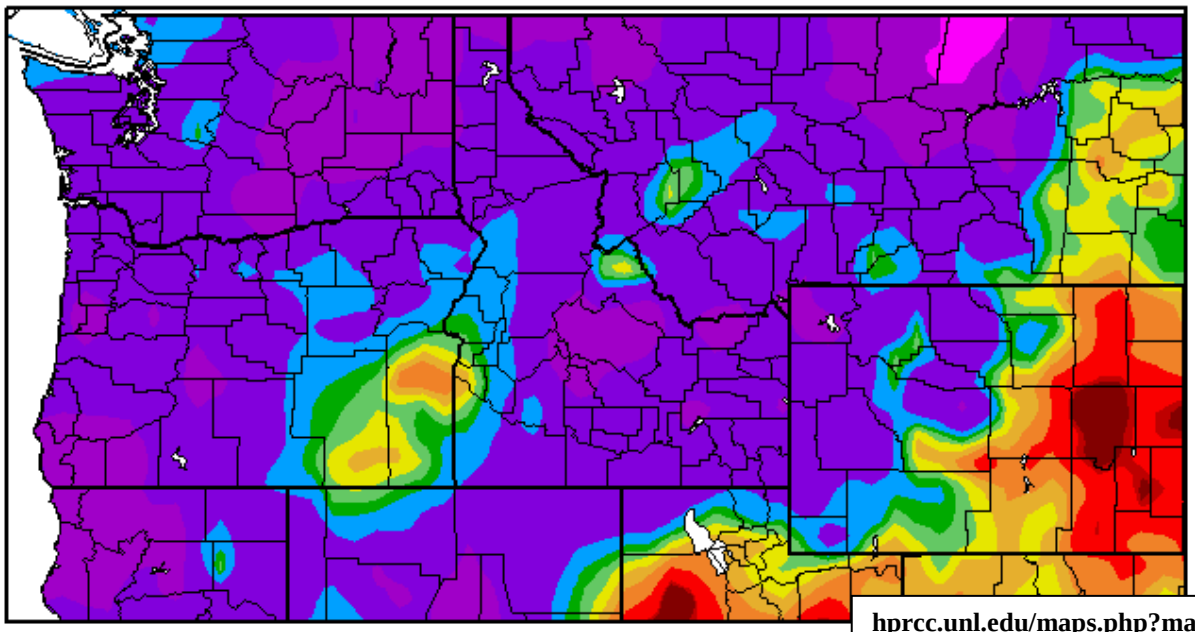


SNOTEL MTD % of Normal Precipitation for end of October 2016
(image is cropped from above image)

Percent of Normal Precipitation (%)
10/1/2016 – 10/31/2016



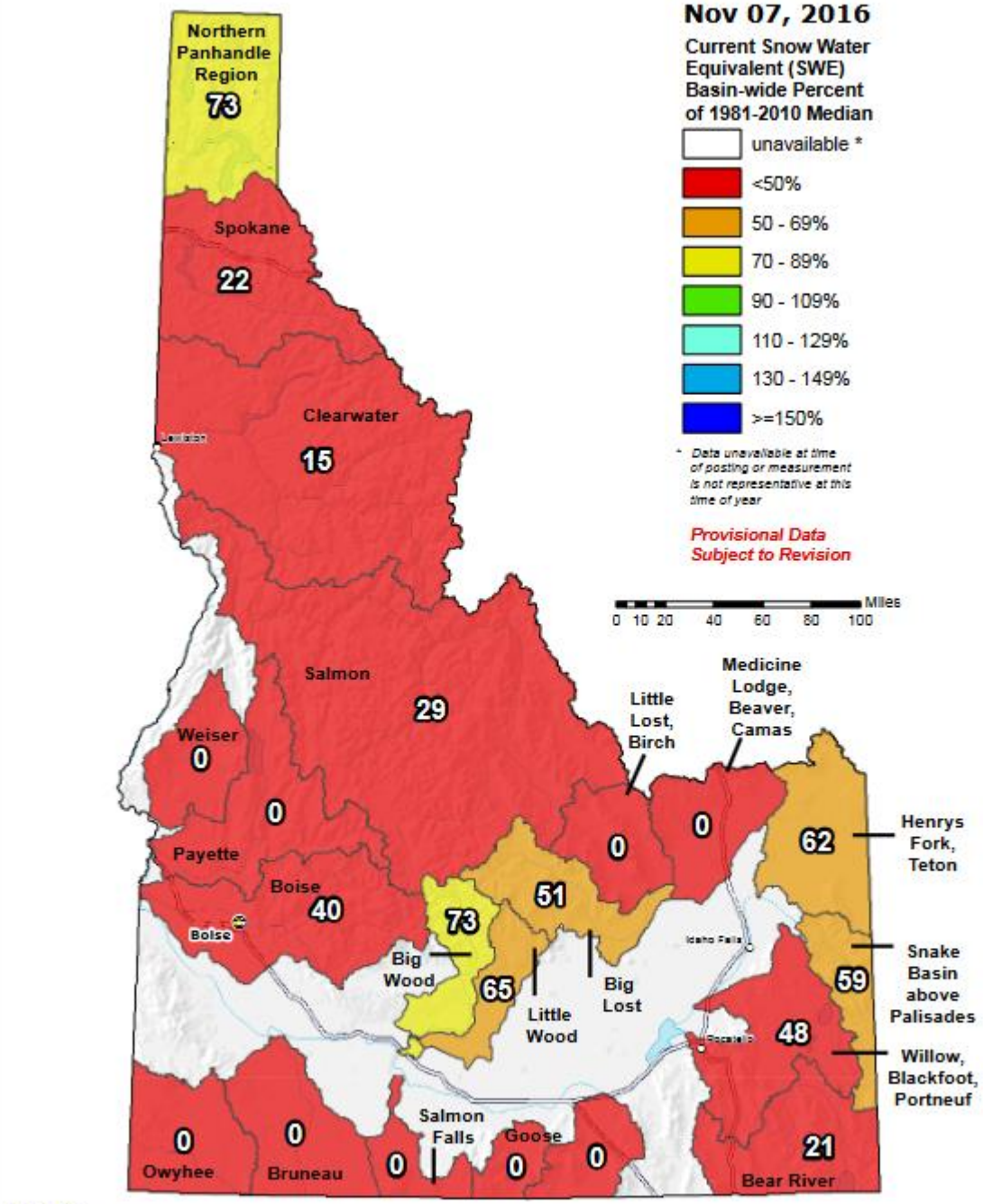
hprcc.unl.edu/maps.php?map=ACISClimateMaps

2 5 25 50 75 100 125 150 200 400 800

Generated 11/5/2016 at HPRCC using provisional data. Regional Climate Centers

October brought continued relief bringing in an abundance of moisture not only in our HSA, but over the entire PNW region. Southeastern Idaho received much needed moisture to prime soils for the water supply season and also brought monthly record amounts in some areas: on the order of 400 to 600 percent of normal. Generally, the area received from 200 to 600 percent of normal for the month. Eastern WY, central UT and CO were drier last month.

Idaho SNOTEL Current Snow Water Equivalent (SWE) % of Normal



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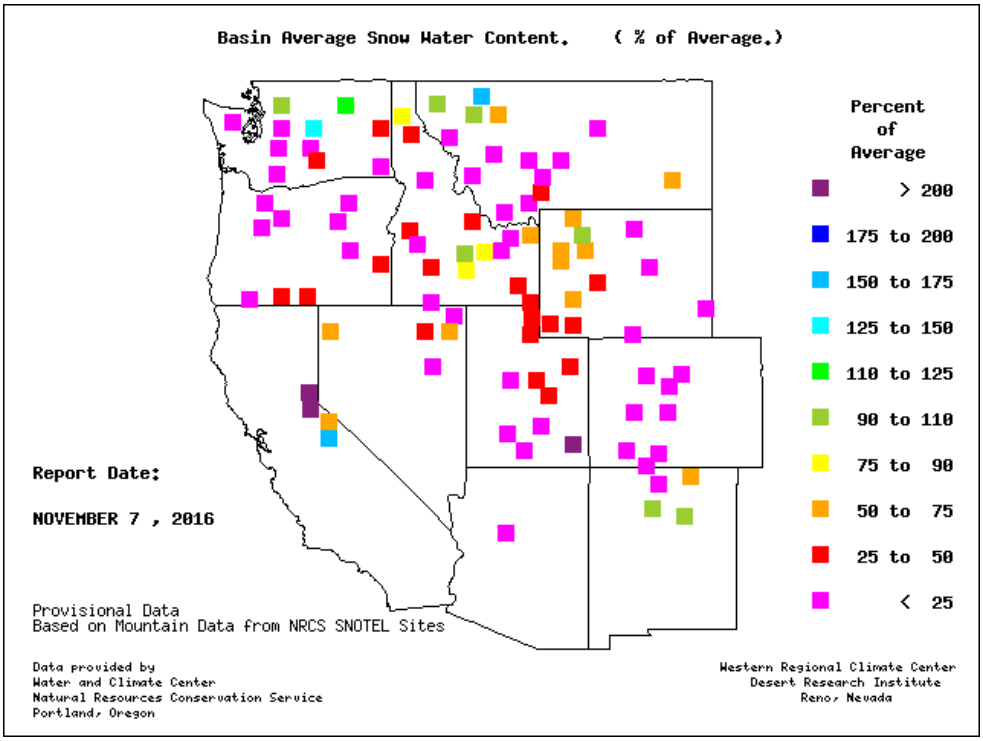

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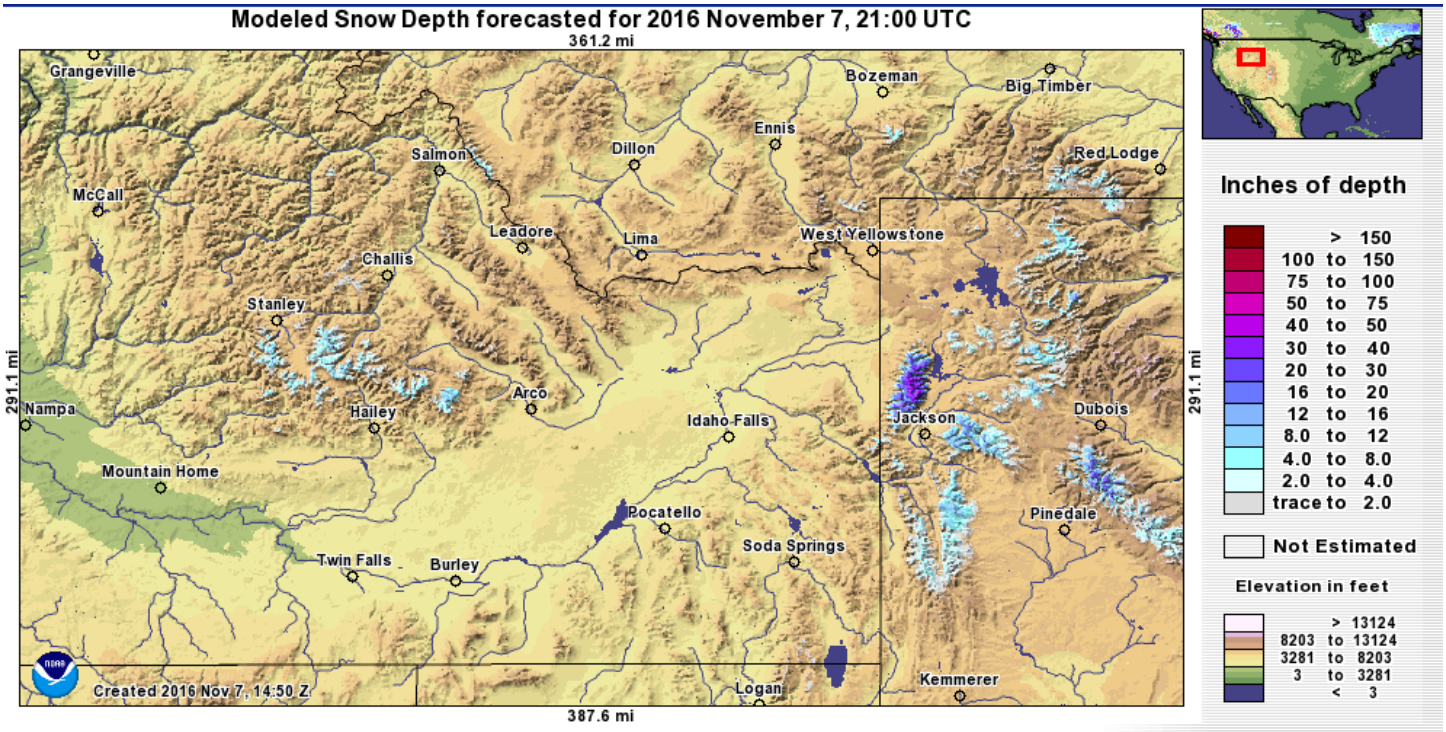
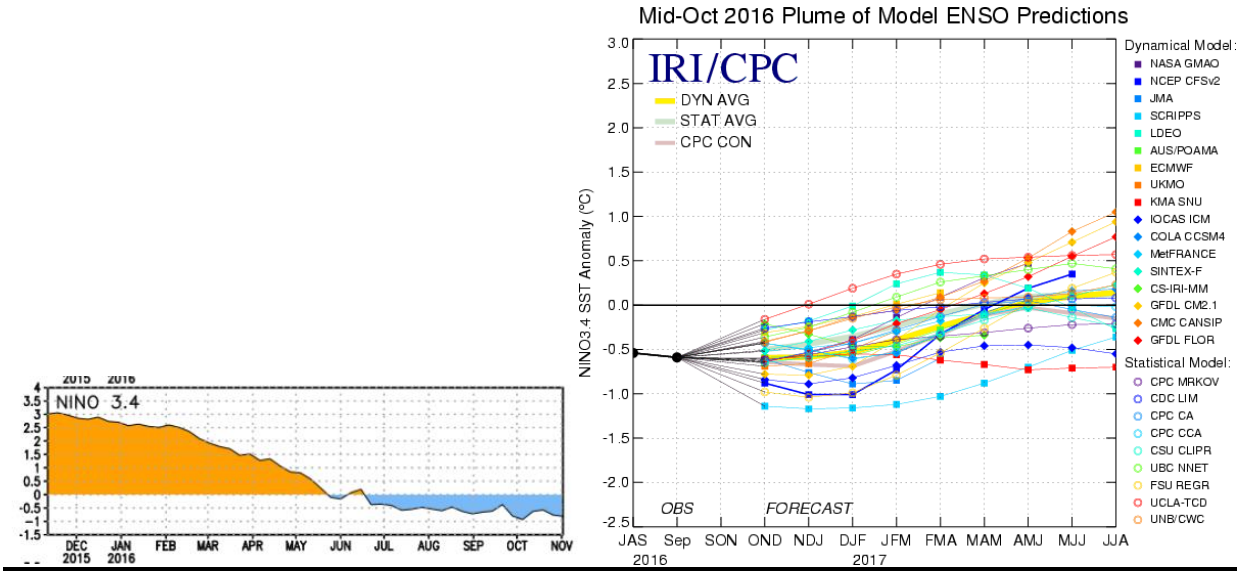


nohrsc.noaa.gov/interactive/html/map.html

ENSO Update:

Latest Observed SST Departure: Niño 3.4 ~ -0.8 Deg C



cpc.ncep.noaa.gov, iri.columbia.edu/climate/ENSO *and* cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.pdf

CPC Synopsis: ENSO-neutral conditions present. La Niña conditions favored to develop (~70% chance) in the northern hemisphere this fall and slightly favored to persist (~55% chance) during winter.

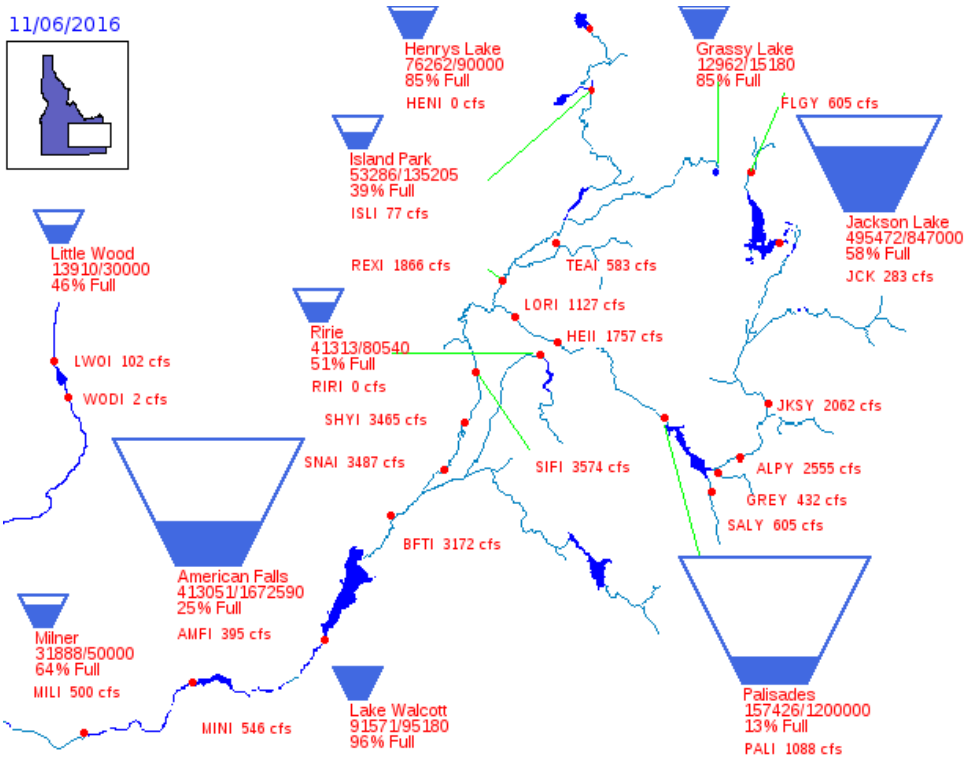
Note: Equatorial sea surface temperature (SST's) are below average in the central and east central equatorial Pacific Ocean. MJO signal continues to be weak but forecast to strengthen. The Pacific Decadal Oscillation (PDO) is currently positive.

Reservoirs:

Reservoir	% Capacity September 30[1]	% Capacity October 31[2]	Percent Change	% of Average[2]	% of Average Last Year[2]
Jackson Lake	52	57	5	117	133
Palisades	21	23	2	41	65
Henrys Lake	83	84	1	99	92
Island Park	20	36	16	68	75
Grassy Lake	81	84	3	115	109
Ririe	61	50	-11	115	114
Blackfoot	55	58	3	123	93
American Falls	11	21	10	64	45
Mackay	28	33	5	144	89
Little Wood	27	41	14	153	51
Magic	29	34	5	121	35
Oakley	14	15	1	71	49
Bear Lake	32	34	2	74	79
Lake Walcott	90[3]	96[4]	6	n/a	n/a
Milner	72[3]	64[4]	-8	n/a	n/a

Source: (1) NRCS September 30, 2016; (2) NRCS October 31, 2016.
(3) US Bureau of Reclamation (BOR) October 2, 2016 (4) BOR November 6, 2016

wcc.nrcs.usda.gov/ftpref/support/water/SummaryReports/ID/BRes_11_2016.pdf

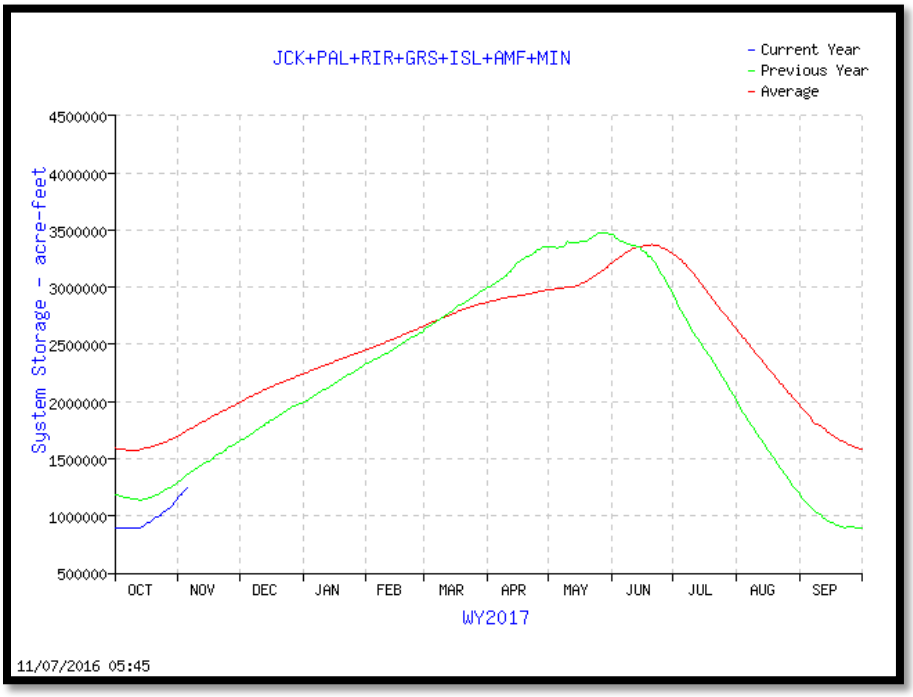


31% of Capacity in Upper Snake River System
(Jackson Lake, Palisades, Grassy Lake, Island Park, Ririe, American Falls & Lake Walcott)

usbr.gov/pn/hydromet/burtea.html

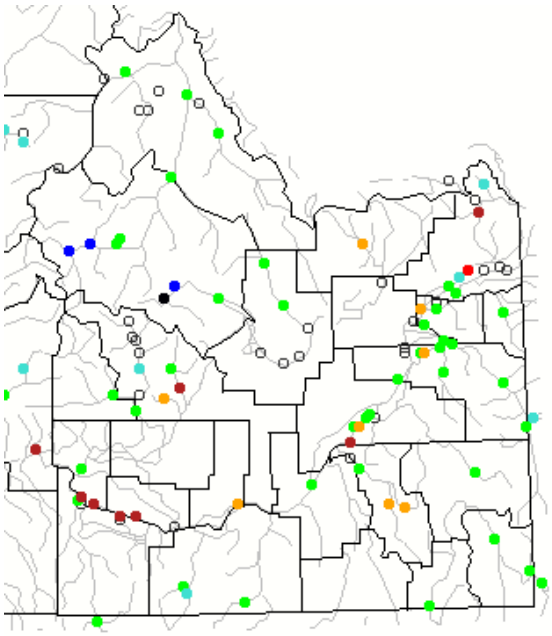
Upper Snake River:
Total Space Available: 2,780,615 AF
Total Storage Capacity: 4,045,695 AF

Graph of Upper Snake River Current Total System Reservoir Storage



usbr.gov/pn-bin/graphwy2.pl?snasys_af

Streamflow:



Monthly average streamflow compared to historical average streamflow for October 2016.

USGS

waterwatch.usgs.gov/?m=mv01d&r=id&w=map

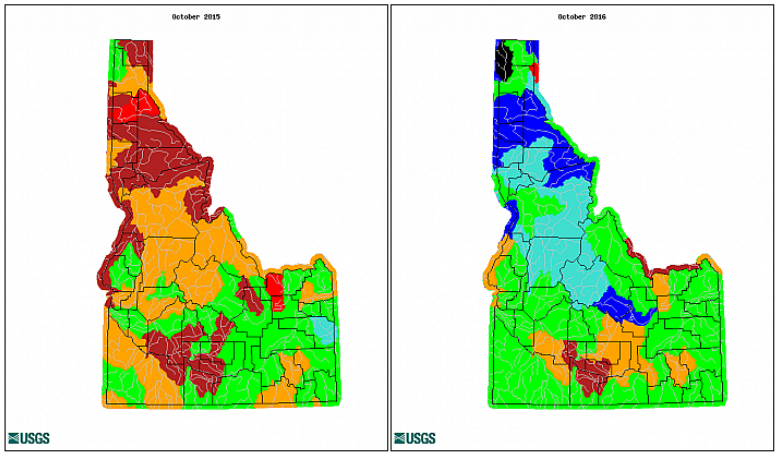
Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

Comparison of Streamflow Maps

Geographic area: Idaho | Water resource region: | GO

Map type: Monthly Streamflow (month of year) | Sub type: HUC Streamflow Map

Date (YYYYMM): 201510 Date (YYYYMM): 201610

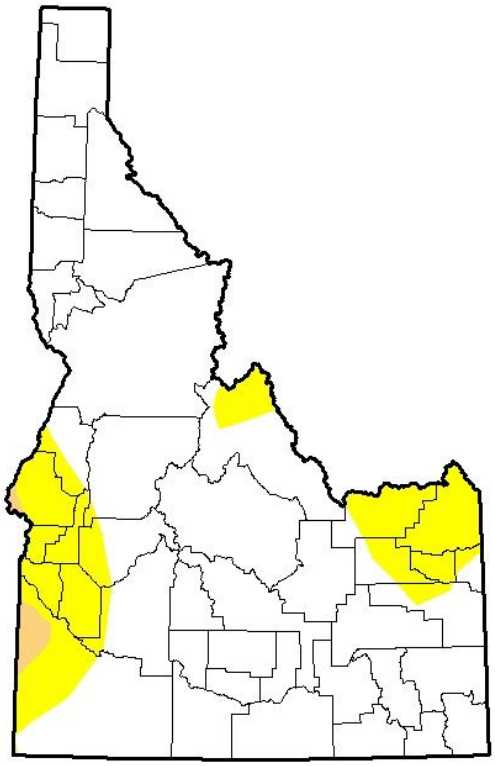


Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	No Data

waterwatch.usgs.gov/index.php

Drought:

U.S. Drought Monitor
Idaho



November 1, 2016

(Released Thursday, Nov. 3, 2016)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	82.66	17.34	1.04	0.00	0.00	0.00
Last Week 10/25/2016	81.81	18.19	1.04	0.00	0.00	0.00
3 Months Ago 8/2/2016	40.07	59.93	0.33	0.00	0.00	0.00
Start of Calendar Year 12/29/2015	10.98	89.02	64.05	24.35	1.18	0.00
Start of Water Year 9/27/2016	6.14	93.86	8.89	0.00	0.00	0.00
One Year Ago 11/3/2015	8.63	91.37	82.14	45.42	16.84	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

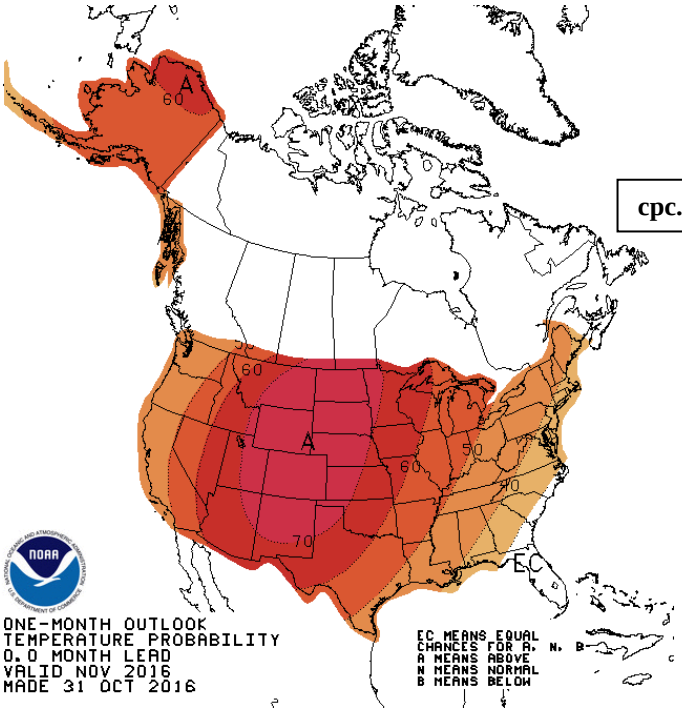
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

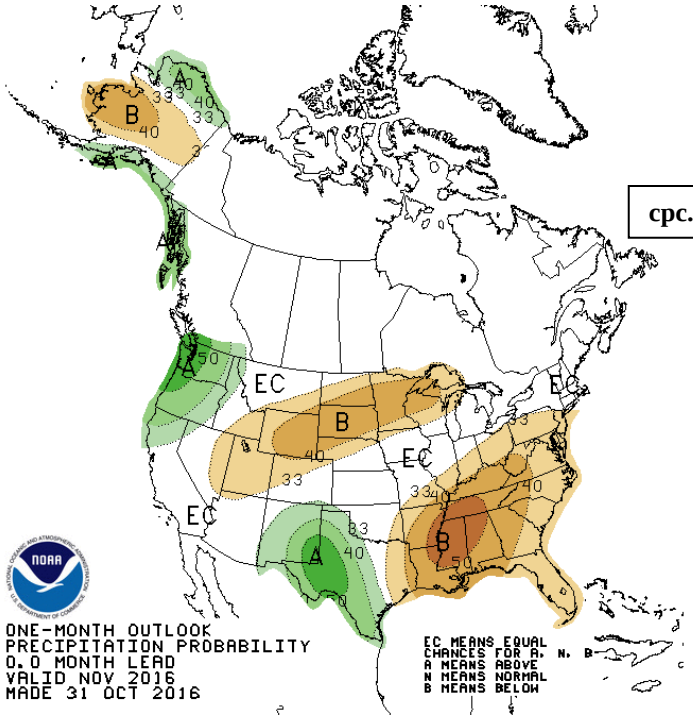
Deborah Bathke

National Drought Mitigation Center

http://droughtmonitor.unl.edu/



cpc.ncep.noaa.gov/products/predictions/30day/off15_temp.gif



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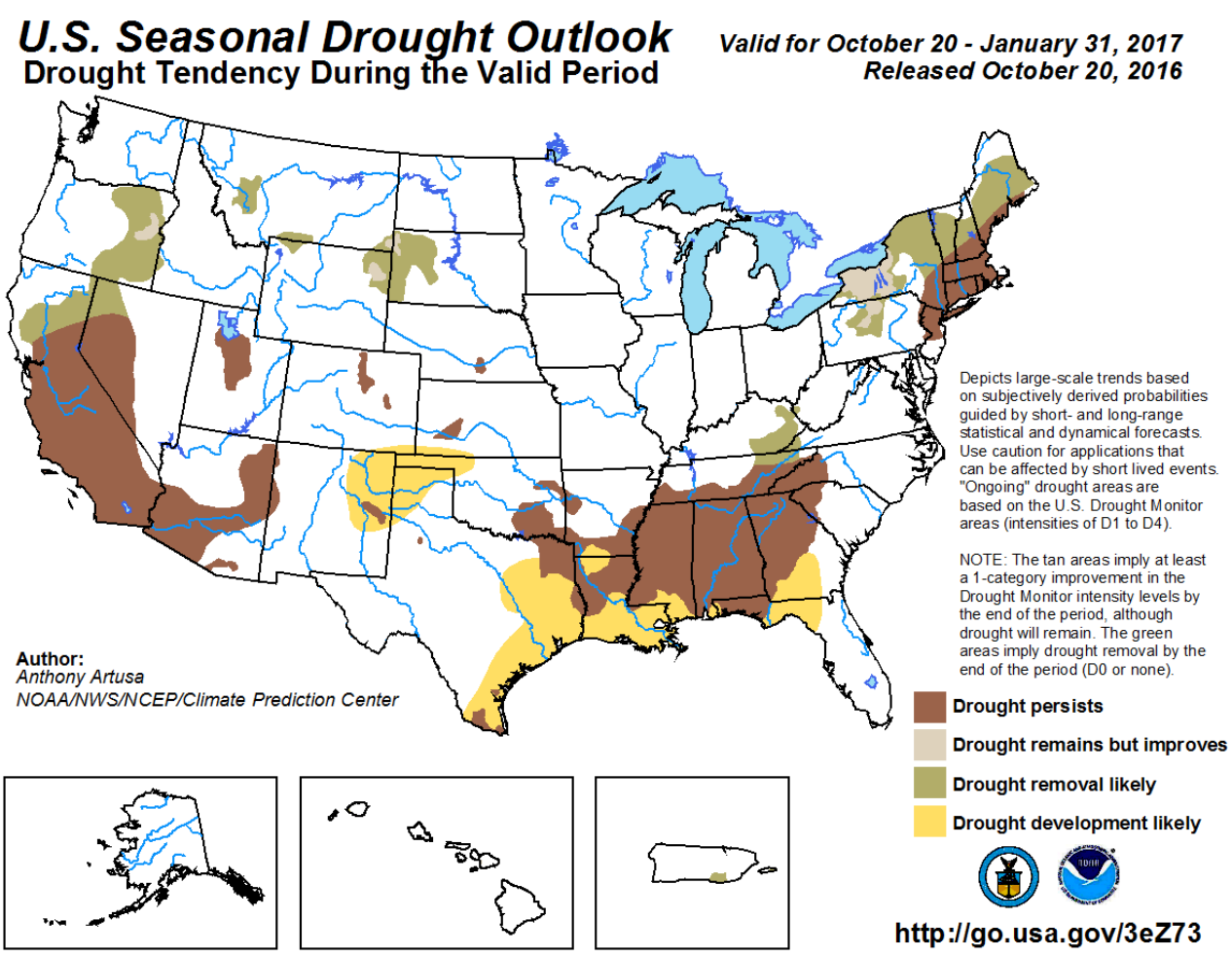

cpc.ncep.noaa.gov/products/expert_assessment/season_drought.png

cc:

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Brent Bernard, Hydrologist, Colorado Basin River Forecast Center
PIH Mets/HMT (pih.ops)

End

cbl